

Claims

[c1] 1. A method for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the method comprising:
determining electromagnetic effects of adjusting positions of the keybars with respect to positions of the phase belts; and
selecting a position of the keybars with respect to a position of the phase belts which provides minimal adverse electromagnetic effects.

[c2] 2. The method of claim 1 further comprising determining electromagnetic effects of adjusting the number of keybars, and wherein selecting the position of the keybars comprises selecting both the position of the keybars and a number of the keybars to provide minimal adverse electromagnetic effects.

[c3] 3. The method of claim 1 further comprising determining electromagnetic effects of adjusting the number of stator slots, and wherein selecting the position of the keybars comprises selecting both the position of the keybars and a number of the stator slots to provide minimal adverse electromagnetic effects.

[c4] 4. The method of claim 1 further comprising determining electromagnetic effects of adjusting a direction of rotation of a rotor with respect to the stator, and wherein selecting the position of the keybars comprises selecting both the position of the keybars and a direction of rotation to provide minimal adverse electromagnetic effects.

[c5] 5. A method for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the method comprising:
determining electromagnetic effects of adjusting positions of the keybars with respect to positions of the phase belts, adjusting the number of keybars, and adjusting the number of stator slots; and
selecting a position of the keybars with respect to a position of the phase belts,

a number of the keybars, and a number of stator slots which collectively provide minimal adverse electromagnetic effects.

- [c6] 6. The method of claim 5 further comprising determining electromagnetic effects of adjusting a direction of rotation of a rotor with respect to the stator, and selecting a direction of rotation to provide minimal adverse electromagnetic effects.
- [c7] 7. A method for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the method comprising:
determining electromagnetic effects of adjusting the number of keybars; and selecting a number of the keybars which provides minimal adverse electromagnetic effects.
- [c8] 8. The method of claim 7 further comprising determining electromagnetic effects of adjusting the number of stator slots, and wherein selecting the number of the keybars comprises selecting both the number of the keybars and a number of the stator slots to provide minimal adverse electromagnetic effects.
- [c9] 9. A method for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the method comprising:
determining electromagnetic effects of adjusting the number of stator slots; and selecting a number of the stator slots which provides minimal adverse electromagnetic effects.
- [c10] 10. A method for operating an electric machine comprising a rotor and a stator comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the method comprising selecting a direction of rotation of the rotor which provides minimal adverse electromagnetic effects on the keybars.

[c11] 11. A system for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the system comprising:
means for determining electromagnetic effects of adjusting positions of the keybars with respect to positions of the phase belts; and
means for selecting a position of the keybars with respect to a position of the phase belts which provides minimal adverse electromagnetic effects.

[c12] 12. The system of claim 10 wherein the means for determining and the means for selecting comprise a computer.

[c13] 13. A system for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the system comprising:
means for determining electromagnetic effects of adjusting positions of the keybars with respect to positions of the phase belts, adjusting the number of keybars, and adjusting the number of stator slots; and
means for selecting a position of the keybars with respect to a position of the phase belts, a number of the keybars, and a number of stator slots which collectively provides minimal adverse electromagnetic effects.

[c14] 14. A system for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the system comprising:
means for determining electromagnetic effects of adjusting the number of keybars; and
means for selecting a number of the keybars which provides minimal adverse electromagnetic effects.

[c15] 15. A system for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding

phase belts within stator slots of the lamination segments, the system comprising:

means for determining electromagnetic effects of adjusting the number of stator slots; and

means for selecting a number of the stator slots which provides minimal adverse electromagnetic effects.

[c16] 16. A system for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the system comprising a computer for performing simulations to determine electromagnetic effects of adjusting positions of the keybars with respect to positions of the phase belts.

[c17] 17. A system for designing a stator for an electric machine comprising lamination segments coupled to a stator frame by keybars and stator winding phase belts within stator slots of the lamination segments, the system comprising a computer for performing simulations to determine electromagnetic effects of adjusting positions of the keybars with respect to positions of the phase belts, adjusting the number of keybars, and adjusting the number of stator slots.